

# NASA'S

## Exploration Architecture

When undertaking a long journey to a new place, it helps to have a road map to guide you. NASA's new space exploration program is such a **journey**, one whose length, complexity, and challenges make a good map especially important. The new *Program and Project Management Processes and Requirements* (NPR 7120.5D), which outline the **policy** and **processes** designed to ensure project **success** and **knowledge sharing** at NASA, are part of that map. Taken together, those requirements and this special pullout of the Agency's exploration architecture—a map of **milestones** for the Constellation program—show where we are going, the important stages of the journey, and what we have to do to reach our **destination**. We hope this map brings into focus what we need to accomplish today and tomorrow to achieve our ambitious goals.

The mission we are beginning now will span decades. We need to define, record, and communicate the path we take to ensure we—those of us working today and those joining the program in the future—are all working with the **same vision** in mind. NASA's new policies and the exploration architecture offered here are part of this process, providing the maps we and our successors will refer to and refine as we expand human **exploration in space**.

# Lunar Mission Profile

[www.nasa.gov/mission\\_pages/constellation/main/index.html](http://www.nasa.gov/mission_pages/constellation/main/index.html)

1. The cargo launch vehicle, Ares V, **lifts off**.
2. Solid Rocket Boosters (SRB) **separate** from Ares V.
3. Earth Departure Stage (EDS) **performs** Earth orbit insertion.
4. Payload shroud **separates** to expose the Lunar Surface Access Module (LSAM).
- 1a. The crew launch vehicle, Ares I, **lifts off**.
- 2a. First stage **separates** from Ares I.
  5. Ares I upper stage **performs** Earth orbit insertion.
  6. Crew exploration vehicle, Orion, **docks** with LSAM and EDS; EDS fires for lunar destination.
  7. Orion and LSAM **separate** from EDS.
  8. Orion and LSAM **enter** lunar orbit.
  9. LSAM **lands** on the lunar surface.
10. Astronauts **perform** lunar surface activities.
11. LSAM ascent stage **lifts off** from lunar surface.
12. LSAM ascent stage and Orion **dock** for crew transfer.
13. Orion **burns** for Trans Earth Injection (TEI).
14. Orion and surface module **separate** and re-enter Earth's atmosphere.
15. Orion **decelerates** through Earth's atmosphere.
16. Parachutes **open** for landing and recovery.

1a



4



3



2



1



2a



5



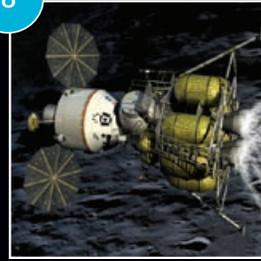
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# The Vision for Space Exploration

There is nothing so far removed from us to be beyond our reach, or so far hidden that we cannot discover it.

RENÉ DESCARTES

We shall not cease from exploration and the end of all our exploring will be to arrive where we started...and know the place for the first time.

T.S. ELIOT

It is difficult to say what is impossible, for the dream of yesterday is the hope of today and reality of tomorrow.

ROBERT GODDARD

In the long run men hit only what they aim at.

HENRY DAVID THOREAU

Where there is no vision, the people perish.

PROVERBS 29:18

The Moon is the first milestone on the road to the stars.

ARTHUR C. CLARKE

The important thing is not to stop questioning.

ALBERT EINSTEIN

For I dipped into the Future, far as human eye could see; saw the vision of the world, and all the wonder that would be.

ALFRED, LORD TENNYSON

I had the ambition to not only go farther than man had gone before, but to go as far as it was possible to go.

CAPTAIN COOK

The greatest gain from space travel consists in the extension of our knowledge. In a hundred years this newly won knowledge will pay huge and unexpected dividends.

WERNHER VON BRAUN

The past is but the beginning of a beginning, and all that is and has been is but the twilight of the dawn.

H.G. WELLS

We are at a point in history where a proper attention to space, and especially near space, may be absolutely crucial in bringing the world together.

MARGARET MEAD

Freedom lies in being bold.

ROBERT FROST

To set foot on the soil of the asteroids, to lift by hand a rock from the Moon, to observe Mars from a distance of several tens of kilometers, to land on its satellite or even on its surface, what can be more fantastic?

KONSTANTIN E. TSIOLKOVSKY, FATHER OF RUSSIAN ASTRONAUTICS

Destiny is not a matter of chance. It is a matter of choice. It's not a thing to be waited for—it is a thing to be achieved.

WILLIAM JENNINGS BRYAN

A sense of the unknown has always lured mankind, and the greatest of the unknowns of today is outer space. The terrors, the joys, and the sense of accomplishment are epitomized in the space program.

WILLIAM SHATNER

In my own view, the important achievement of Apollo was a demonstration that humanity is not forever chained to this planet, and our visions go rather further than that, and our opportunities are unlimited.

NEIL ARMSTRONG